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Climate Program Office ESSM Division Update

- ESSM held a workshop and annual ESSM Council meeting on Nov. 6-7, 2018 in Silver Spring, MD. Workshop information including the links to the workshop agenda and presentations can be found in this issue.
- In FY18, the ESSM programs (AC4, CVP & MAPP) funded 42 new projects.
- FY19 proposals are currently under review. It is expected that funding decisions will be made in Spring/Summer 2019 depending on the time we receive our FY19 budget.
- Starting in FY19, ESSM will include a new program called Climate Observation and Monitoring. A brief introduction of COM can be in this newsletter.

Programs

AC4 (Atmospheric Chemistry, Carbon Cycle, and Climate)

COM (Climate Observation and Modeling)

CVP (Climate Variability and Predictability)

MAPP (Modeling, Analysis, Predictions, and Projections)

ESSM Workshop Highlights

The [ESSM Workshop and the annual ESSM Council meeting](#) was held on Nov. 6-7, 2018 in Silver Spring MD. CPO's climate and Earth System research priorities and partnership strategies were discussed in the context of pressing research challenges/opportunities, operation/application requirements, and core capabilities and gaps at OAR labs. The workshop participants included scientists from the research community, all OAR labs and NOAA line offices. A full workshop report is under development. After the ESSM workshop, there have been several follow-up discussions with NOS and NMFS on their requirements for climate science. There will be continuous follow-on discussions with OAR labs on specific science priorities. The high level recommendations also help inform CPO strategic discussions on its future vision and near-term research priorities.

Program Introduction (COM)



The Climate Observation and Monitoring (COM) Program used to be under CPO's Ocean Observation and Monitoring Division (OOMD). Starting from FY19, COM will be moved to the ESSM Division. The COM program focuses on the development and improvement of climate and Earth system related data sets, the transformation of climate and Earth system-related observations into authoritative products, and the interpretation of these products to better understand the past, current and changing state of the climate and Earth systems. We're currently in the process of hiring a new COM Program Manager. We also plan to formally review the COM program as an integral part of the ESSM Division.

FY19 Budget Update

The FY19 Budget has been passed and signed by the president on February 14, 2019. The FY19 President's Budget proposed to eliminate the Climate Competitive Research budget line, which funds the majority of ESSM programs, but the final appropriation resulted in level funding for the budget line and specific Congressional language prohibiting the elimination of the Climate Competitive Research.

PPA	FY18 Pres. Budget	FY18 enacted	FY19 Pres. Budget	FY19 enacted
Climate Competitive Research (in \$K)	38,000	60,000	0	60,000

Program Update: AC4

Preparations for FIREX-AQ, the aircraft-ground-satellite field phase of the wildfire emission and chemistry project are underway. The focus remains mostly on smoke emissions in Western US, but a variety of fires will be sampled and studied, including prescribed burns and fires in Eastern US. The overall goal of the mission, including the [laboratory phase](#) in Fire Science Laboratory in 2016, is to determine the chemical composition of the smoke. Deployment is scheduled for late Summer 2019. This is a NOAA-NASA collaboration with many academic and private sector scientists involved. More updates can be found [here](#) .



Urban Atmosphere: Urban carbon flux synthesis project “[CO2-USA](#)” continues organizing scientists and engaging city stakeholders across the US in ways to verify emission reductions goals that many cities currently are setting is well underway. The third in a series workshop will take place in Boston in October 2019. The broader scientific conversation is expanding beyond carbon and into including particular aspects of air quality. These include ALPACA [white paper](#) focused on winter air quality in Fairbanks, AK, with a proposed field phase in early 2021 and AQUARIUS (Air QUALity Research in the western US) which will address wintertime particulate matter (PM) in intermountain west basins, many of which include urban areas which will conduct a workshop this spring.

10 projects from the FY18 competition focus on biogenic emissions are underway and a task team has been formed to coordinate the activities.

A multi-institution team supported by AC4 has successfully completed substantial improvements to the representation of the reactive nitrogen biogeochemical cycle in GFDL Earth System Models. Improvements include:

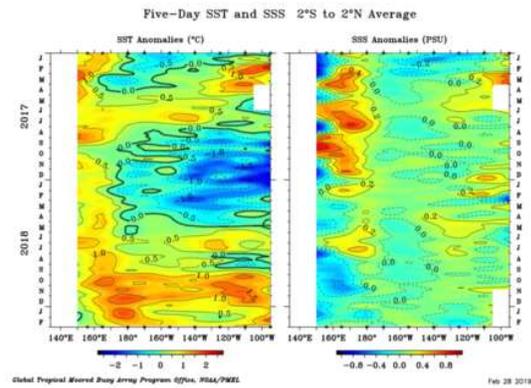
- Development of an improved, comprehensive representation of reduced-nitrogen cycling in the GFDL atmospheric model, AM3
- Design and implementation of a new terrestrial nitrogen cycle model for the GFDL land models LM3 and LM4.1
- Coupling of atmospheric reactive nitrogen to land and ocean
- Application of GFDL-AM3 to study trends in sulfate aerosol over the US, regional enhancements of NH₃ from fire emissions, and recent trends in aerosol radiative effects on climate
- Development of new emissions inventory for N₂O from agriculture

Program Update: CVP

CVP-TPOS Pre-Field Modeling Studies :

In FY18, CVP funded 8 new projects in support of future TPOS process studies. Field campaign/process studies are recommended as a component of overall TPOS 2020 effort. The newly funded

projects will use climate and ocean models to examine the importance of barrier layers, fronts, and ocean dynamics in mixing and air-sea interaction of the Tropical Pacific. All of the CVP-TPOS projects have PIs or collaborators from the academic community. Half of the projects include a NOAA or NOAA-Cooperative Institute scientist. The CVP-TPOS group held its first of several planned PI meetings during the week of AGU in Washington, DC. The next meeting will be planned for late March.



Years of the Maritime Continent (YMC) Field Campaigns update : YMC is an international project from 2017 through 2020 with US, Indonesia and Japan.

Joint Indonesia-NOAA Cruise : There are plans for a 30-day research cruise from Jakarta to the Banda Sea for November 2019. The Indonesian ship will measure the atmospheric conditions, upper ocean properties, and air-sea exchanges. This is an exciting opportunity as there is little data from this region and this data will help to understand the diurnal cycle of the system during a season that is known for MJO activity along the equator. CVP is co-funding the cruise as well as 3 projects to take field measurements during this cruise. This cruise is a collaboration with CVP, OAR, PMEL, and Indonesia.

Indonesia-NOAA Workshop 2019 : A NOAA-BMKG workshop will be held in Jakarta in late July or early August 2019. It is expected that YMC will be the focus of a session during the meeting. CVP is co-funding the cruise as well as three projects to take field measurements during this cruise. This cruise is a collaboration with CVP, OAR, PMEL, and Indonesia.

Program Update: MAPP

Focus on key issues for CMIP6-class models : A new set of 9 MAPP research projects were selected in FY18, adopting a process evaluation approach to accelerate progress in climate model development. This continues efforts initiated under the Model Diagnostics Task Force. Projects include the development of an open framework for process-oriented diagnostics and focused efforts to target key issues in CMIP6 class models of specific NOAA interest. Among these, Arctic sea ice variability, Pacific sea level changes, tropical storms genesis, persistence of droughts and storms, changes in rainfall patterns and the North American Monsoon, and lake-effects on snowstorms in the Great lake region.

Model-JPSS Data Integration for Earth System Monitoring : MAPP in partnership with AC4 and the JPSS program, has initiated five new projects that integrate data from JPSS, as well as other sources, with models to help monitor the state of the Earth system. Projects focus on monitoring land surface characteristics, such as vegetation and drought conditions, and atmospheric composition, including aerosol content and carbon cycle elements.

NOAA General Modeling Meeting and Fair Brings Together Modeling Community :

The MAPP program was the lead organizer for the inaugural NOAA Modeling Meeting and Fair, held Sept. 10-12 at the NOAA Center for Weather and Climate Prediction in College Park, Maryland, which convened nearly 200 scientists and managers from government, academia, and private industry. The meeting built on recent modeling efforts by bringing the NOAA modeling community together to share ideas on how to advance modeling and network with other professionals. Under the auspices of the NOAA Research Council's Unified Modeling Committee, and involving all NOAA Line Offices, this was the inaugural event in what participants hope will become a regular event.



MAPP Task Force Updates

Marine Prediction Task Force: Two group papers are well underway, integrating research insights from individual projects. One, led by Mike Jacox (SWFSC) focuses on mechanisms of predictability relevant to marine prediction, while the other, led by Antonietta Capotondi (ESRL) focuses on the use of observations for the modeling and prediction of marine ecosystems.

Drought Task Force: There has been a focus on indicators and their use in drought monitoring. The DTF is beginning to outline synthesis material on this topic which will explore various indicators and aspects of their technical construction and usability.

Model Diagnostics Task Force: A new set of funded projects and investigators (FY18-FY20) has been integrated into the Task Force, which continues with David Neelin (UCLA) now serving as the group lead. Yi Ming (GFDL) and Andrew Gettelman (NCAR) continue to serve as the modeling center co-leads. Allison Wing (FSU) is joining as a co-lead. Many thanks to Eric Maloney (CSU) for his leadership over the past three years; he will continue as a co-lead for the activity. Early calls for this group will focus on establishing the state of the software package and learning about the new research efforts.

S2S Prediction Task Force: Presentations at the International Conference on Seasonal to Decadal Prediction (S2D) showed that the group's research has already made significant contributions to overall progress in S2S research, highlighting the interplay of physical processes that are key for predictions, examining their simulation in numerical models, and pioneering the development of new prediction methodologies. These initial results are also helping to set future S2S research and development agendas.

News & Meetings

Dr. Neil Jacobs is now the Acting NOAA Administrator (no permanent administrator confirmed). Tim Gallaudet is the NOAA Deputy Administrator.

NOAA Climate & Global Change Postdoctoral Program, funded by CPO for the past 27 years and managed by UCAR, has undergone a review. Review report was approved by NOAA Climate Working Group and is being considered by the NOAA Science Advisory Board.



[National Climate Assessment](#) and the [Second State Of Carbon Cycle Report \(SOCCR2\)](#) were released on November 23.

Meetings sponsored by ESSM:

- CO2-USA workshop #2 focused on urban carbon fluxes and stakeholder engagement took place in Salt Lake City, UT in October 2018, and workshop #3 will take place in Boston in October 2019
- FIREX-AQ planning meeting took place in Boulder in October 2018
- US CLIVAR Sources and Sinks of Ocean Mesoscale Eddy Energy, March 12-14, 2019, Tallahassee, FL
- OceanVisions2019-Climate, April 1-4, 2019, Georgia Institute of Technology, Atlanta, GA
- 2019 US Climate Modeling Summit, April 3-4, 2019, Greenbelt, MD
- US CLIVAR Sea Level Hotspots from Florida to Maine, April 23-25, 2019, Norfolk, VA
- Workshop on Urban Scale Processes and their Representation in High Spatial Resolution Earth System Models, Chicago, May 2019
- Atmospheric Convention and Air-Sea Interactions Over the Tropical Oceans Workshop, May 7-9, 2019, Boulder, CO
- Tri-MIP-athalon-2, June 11-14, 2019, Princeton, NJ
- WCRP 40th Anniversary Symposium at 2019 Fall AGU, San Francisco, December 8, 2019

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